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CLEAN UNMARKED COPY OF AMENDED CLAIMS

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CLAIM 1 (nce amended) A method for making a coordinated and complementary set of holograms to be used in a system for recording and projection of images in substantially 3-dimensional format, said method comprising the steps of:

producing the reference beam by passing diffuse coherent light from a laser through the first active optical system containing a plurality of image focusing means therein; and

producing the object beam by passing diffuse coherent light from the same laser through a second active optical system containing a plurality of image focusing means therein of the same number and arrangement as the first active optical system, the F-number of each said focusing means of the second active optical system being the same as the F-number of the first active optical system, and each said focusing means of the first optical system, wherein all of the component parts of an equation used for determining the F-number of the second optical system are substantially the same multiples of all of the component parts used for determining the F-number of the first active optical system, respectively, said multiple being equal to the expected magnification of the 3-dimensional image.

CLAIM 2 (once amended) A method according to claim 40 wherein a movable aperture is made a part of each of said two active optical systems such that the size and shape of the aperture of the first active optical system is the same as an elemental image of the unmagnified integral photograph and the size and shape of said aperture of the second active optical system is the same as an elemental image of the magnified integral photograph, said movable aperture being placed between the diffuser plate of each of the

image focusing means contained in the active optical system and adjacent to the surface of the diffuser plate, and said method comprising the steps of:

positioning said movable aperture in the first active optical system so that it coincides with the position of the first elemental image of the unmagnified integral photograph; and,

positioning said movable aperture in the second active optical system so that it coincides with the position of the first elemental image of the magnified integral photograph; and,

producing the reference beam by passing diffuse coherent light from a laser through the first active optical system; and,

producing the object beam by passing diffuse coherent light from the same laser through the second active optical system; and,

allowing the reference and object beams to impinge upon the photographic plate for a sufficient time to expose the hologram; and,

thereafter, positioning said movable aperture in the first active optical system so that it coincides with the positions of the second elemental image of the unmagnified integral photograph, the third elemental image of the unmagnified integral photograph, the fourth elemental image of the unmagnified integral photograph, and so on, each positioning of the aperture comprising a step in the process; and,

at the same time, positioning said movable aperture in the second active optical system so that it coincides with the positions of the second elemental image of the magnified integral photograph, the third elemental image of the magnified integral

photograph, the fourth elemental image of the magnified integral photograph, and so on, each positioning of said aperture comprising a corresponding simultaneous step in the process; and,

for each corresponding step, produce the reference and object beams and in the same manner as they were produced for the first elemental position; and,

for each corresponding step, expose the same hologram in the same manner as it was in the previous steps, making sure that both apertures always move together.

CLAIM 9 (once amended) A method according to claim 2 of preparing a hologram to be used for elemental image multiplexing in a system for recording and projection of images in substantially 3-dimensional format, said method comprising the steps of:

positioning a first movable aperture in the unmultiplexed image plane so that it coincides with the position of the first elemental image of the unmultiplexed integral photograph; and,

positioning a second movable aperture in the multiplexed image plane so that it coincides with the position of the first elemental image of the multiplexed integral photograph; and,

producing the reference beam by passing diffuse coherent light from a laser through the first aperture; and,

producing the object beam by passing diffuse coherent light from the same laser through a second aperture; and,

allowing the reference and object beams to impinge upon the photographic plate for a sufficient time to expose the hologram; and,

thereafter, positioning the first movable aperture in the unmultiplexed image plane so that it coincides with the positions of the second elemental image of the unmultiplexed integral photograph, the third elemental image of the unmultiplexed integral photograph, the fourth elemental image of the unmultiplexed integral photograph, and so on, each positioning of the aperture comprising a step in the process; and,

at the same time, positioning the second movable aperture in the multiplexed image plane so that it coincides with the positions of the second elemental image of the multiplexed integral photograph, the third elemental image of the multiplexed integral photograph, the fourth elemental image of the multiplexed integral photograph, and so on, each positioning of the aperture comprising a corresponding simultaneous step in the process; and,

for each corresponding step, produce the reference and object beams and in the same manner as they were produced for the first elemental position; and,

for each corresponding step, expose the same hologram in the same manner as it was in the previous steps, making sure that both apertures always move together.

CLAIM 12 (once amended) A method according to claim 39 of preparing a hologram to be used as a front projection holographic screen for reconstructing magnified 3-dimensional images projected from unmagnified integral photographs or holograms, wherein at least three monochromatic laser beams are used to prepare the hologram,

such that the three wavelengths of laser light are complementary so as to produce the appearance of white light, said method comprising the steps of:

optically splitting the first monochromatic laser beam into a reference beam and an object beam such that the reference beam has a spherical wavefront that appears to have been generated at a reasonably large distance and the object beam has a cylindrical wavefront that appears to have been generated at a calculated distance (a focal point for that wavelength); and,

exposing a transparent photographic plate with said monochromatic laser light such that the reference beam impinges on the emulsion side of the photographic plate while the object beam impinges on the side opposite from the emulsion, in such a manner wherein the reference beam exposes the entire plane of the photographic plate in all directions, and the object beam results from a line of light that extends across the entire photographic plate in the linear dimension and a distance f from the surface of the emulsion, said distance f being calculated as the focal length from the required ($F/\#$) of the screen focusing elements; and,

repeating the previous two steps for the second monochromatic laser beam such that the line of light exposed by the object beam is adjacent to and parallel to the line of light exposed by the first monochromatic laser, such that the two lines are not coincident; and,

repeating the first two steps for the third monochromatic laser beam such that the line of light exposed by the object beam is adjacent to and parallel to the line

of light exposed by the second monochromatic laser, such that it is not coincident with the line produced by either the first or second monochromatic laser; and,

repeating all of the above steps to ultimately form a number of parallel adjacent sets of three adjacent parallel lines produced by the three monochromatic laser beams so that they may repeat in groups of three across the entire photographic plate.

CLAIM 23 (once amended) A method according to claim 38 of preparing a hologram to be used in a system for recording and projection of images in substantially 3-dimensional format as a high quality holographic imaging system to transfer low abberation and low distortion images, said method comprising the steps of:

passing coherent light emanating from a laser through a first diffusing screen and further passing the resulting scattered coherent light through a standard projection lens that neither magnifies nor demagnifies, wherein the resulting coherent light becomes the reference beam; and,

passing coherent light emanating from the same laser through a second diffusing screen and further passing the resulting scattered coherent light through a high quality lens system specially designed to be abberation and distortion free, wherein the resulting coherent light becomes the object beam; and,

exposing the photographic plate with both reference and object beams to produce the hologram.

CLAIM 30 (once amended) A method of making a hologram capable of reconstructing an image in substantially 3-dimensional format when used with an active optical system containing a plurality of image focusing means therein, said method comprising the steps of:

passing a laser beam through a standard lens so as to produce the reference beam; and,

illuminating an integral photograph using the same laser; and,

projecting said laser illuminated image of the integral photograph onto a diffuser plate so as to produce the object beam; and,

allowing the reference and object beams to pass through an aperture or slit, and impinge together upon the surface of a photographic film or plate for a sufficient time for photographic exposure.

CLAIM 33 (once amended) A method according to claim 38 of preparing a second integral photograph to be used in a system for recording and projection of images in substantially 3-dimensional format, from a first integral photograph wherein said first integral photograph used together with an active optical system comprising a plurality of image focusing means therein reconstructs a 3-dimensional image that is pseudoscopic, and wherein said second integral photograph used together with an active optical system comprising a plurality of image focusing means therein reconstructs a 3-dimensional image that is orthoscopic, said method comprising the steps of:

reconstructing a pseudoscopic real image from the first integral photograph using an active optical system comprising a plurality of image focusing means therein; and,

photographing the pseudoscopic real image onto a photographic film or plate using an identical active optical system comprising a plurality of image focusing means therein as was used to reconstruct the pseudoscopic real image from said first integral photograph.

CLAIM 34 (once amended) A method according to claim 38 of preparing a hologram to be used in a system for recording and projection of images in substantially 3-dimensional format, from an integral photograph wherein said integral photograph used together with an active optical system comprising a plurality of image focusing means therein reconstructs a 3-dimensional image that is pseudoscopic, and wherein said hologram reconstructs a 3-dimensional image that is orthoscopic, said method comprising the steps of:

illuminating the integral photograph with coherent radiation from a laser, thereby producing an object beam by reconstructing a pseudoscopic real image from said integral photograph using an active optical system comprising a plurality of image focusing means therein; and,

producing a reference beam using the same laser as was used to illuminate the integral photograph; and,

exposing a photographic plate or film using the reference and object beams so produced.

CLAIM 35 (once amended) A method according to claim 38 of preparing a second hologram to be used in a system for recording and projection of images in substantially 3-dimensional format, from a first hologram wherein said first hologram reconstructs a 3-dimensional image that is pseudoscopic, and wherein said second hologram reconstructs a 3-dimensional image that is orthoscopic, said method comprising the steps of:

illuminating said first hologram with coherent radiation from a laser, thereby producing an object beam by reconstructing a pseudoscopic real image; and,

producing a reference beam from the same laser as was used to illuminate said first hologram; and,

exposing a photographic plate or film using the reference and object beams so produced.

CLAIM 36 (new claim) The method according to claim 1 wherein a coordinated and complementary set of holograms is produced whereby said coordinated and complementary set of holograms, once produced, is capable of accepting as its input reference beam an optical wavefront from a 3-dimensional scene an of reconstructing as its output object beam an optical wavefront from said 3-dimensional scene in magnified format such that the magnification is the same in all three-dimensions.

CLAIM 37 (new claim) The method according to claim 1 wherein a single hologram is produced whereby said hologram, once produced, is capable of accepting as its input reference beam an optical wavefront from a 3-dimensional scene an of reconstructing

as its output object beam an optical wavefront from said 3-dimensional scene in magnified format such that the magnification is the same in all three-dimensions.

CLAIM 38 (new claim) The method according to claim 36 wherein only some of the elements comprising said first and second active optical systems are holograms, the remaining elements of said first and second active optical systems being comprised of other types of optics.

CLAIM 39 (new claim) The method according to claims 36, 37, or 38 wherein a hologram is prepared by exposing portions of a photographic plate incrementally until the entire hologram is produced.

CLAIM 40 (new claim) The method according to claim 39 wherein movable apertures are used to expose said portions of said photographic plate incrementally until the entire hologram is produced and are used to protect other portions of said photographic plate from being exposed.

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CLAIM HISTORY

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CLAIM HISTORY

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1	**Once Amended (05/14/2003)**	←
2	**Once Amended (05/14/2003)**	←
3	Original Claim - Unamended	
4	Original Claim - Unamended	
5	Original Claim - Unamended	
6	Original Claim - Unamended	
7	Original Claim - Unamended	
8	Original Claim - Unamended	
9	**Once Amended (05/14/2003)**	←
10	Original Claim - Unamended	
11	Original Claim - Unamended	
12	**Once Amended (05/14/2003)**	←
13	Original Claim - Unamended	
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CLAIM HISTORY

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21	Original Claim - Unamended
22	Original Claim - Unamended
23	**Once Amended (05/14/2003)** ←
24	Original Claim - Unamended
25	Original Claim - Unamended
26	Original Claim - Unamended
27	Original Claim - Unamended
28	Original Claim - Unamended
29	Original Claim - Unamended
30	**Once Amended (05/14/2003)** ←
31	Original Claim - Unamended
32	Original Claim - Unamended
33	Original Claim - Unamended
34	**Once Amended (05/14/2003)** ←
35	**Once Amended (05/14/2003)** ←
36	**New Claim (05/14/2003)** ←
37	**New Claim (05/14/2003)** ←
38	**New Claim (05/14/2003)** ←
39	**New Claim (05/14/2003)** ←
40	**New Claim (05/14/2003)** ←